

# PATENT ABSTRACTS OF JAPAN

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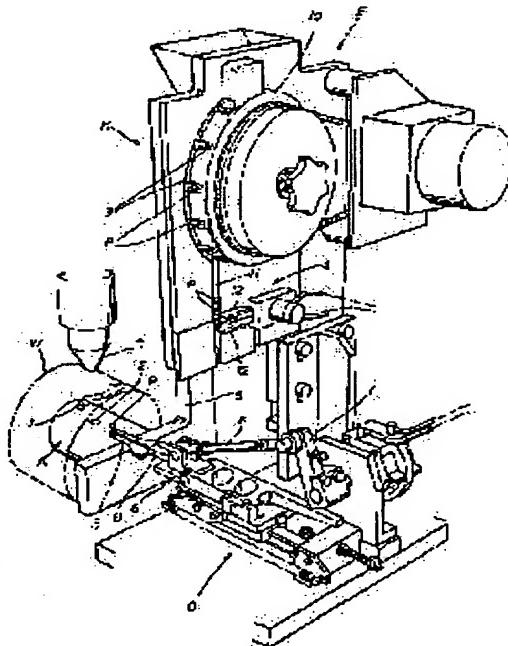
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## (54) CAULKING DEVICE

### (57)Abstract:

**PURPOSE:** To provide an excellent caulking device which has an excellent mass-productivity with a simple structure and whose machine can be designed compactly as a whole without applying a rotary system even by adopting a simple supplying arm system.

**CONSTITUTION:** A supporting part A is installed on the front face of a machine body K, a press part C is installed to be freely vertically moved on the upper side of this supporting part A, a moving mechanism D to move and control a supplying arm B is installed on the back part of the machine body K, a caulking pin supplying mechanism E is installed on the upper part of the machine body K, the supplying arm B is installed to be freely movable with sliding forth and back so as to project with sliding to the front face from the back part, at the same time the supplying arm B slid back to the back part is installed freely standing, lying and moving so that it can be stood upward and the moving mechanism D is composed. A holding mechanism 3 to hold a caulking pin P is installed on the top end part of the supplying arm B moved and controlled with this moving mechanism D, and a supply controlling mechanism 4 making the holding mechanism 3 of the supplying arm B slid and retreated to the back side, stood upward and ascended to hold the caulking pin capable of successively supplying by a prescribed numbers is installed on a caulking pin supplying mechanism E.



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CLAIMS

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## [Claim(s)]

[Claim 1] In the supply arm which carries out sequential supply of the caulking pin at the bearing section which supports the work piece which has a caulking hole, and the pin positioning section of this bearing section, and the caulking equipment which consists of the press section which closes the caulking pin supplied in the pin positioning section Prepare said bearing section in the transverse plane of an airframe, and said press section is prepared above this bearing section free [ vertical movement ]. While establishing behind an airframe the migration device which carries out migration control of said supply arm, preparing a caulking pin feeder style in the upper part of an airframe, and preparing free [ order slide migration ] so that the slide protrusion of said supply arm can be carried out from regions of back to a transverse plane Prepare free [ boom-hoisting migration ] and said migration device is constituted so that the supply arm which carried out the back slide can start to regions of back upwards. The maintenance device in which said caulking pin is held to the point of the supply arm in which migration control is carried out by this migration device is established. Caulking equipment which carries out slide evacuation to back, and is characterized by establishing the supply controlling mechanism which makes the caulking pin which can be supplied to the maintenance device of the supply arm which rose upwards and went up one after another hold a predetermined number every at said caulking pin feeder style.

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DETAILED DESCRIPTION

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## [Detailed Description of the Invention]

[0001]

[Industrial Application] This invention relates to caulking equipment with an automatic feeder style.

[0002]

[Description of the Prior Art] For example, in the caulking equipment used for attaching Toride firmly to the peripheral surface of a pan etc., caulking equipment with an automatic feeder style which carries out automatic supply of the caulking pin one by one is desired.

[0003] For example, a caulking pin is held by the supply arm from a caulking pin feeder style. Move this supply arm and a caulking pin is supplied to every one pin positioning section of the bearing section. A work piece is set to this bearing section as the caulking hole of a work piece is made to penetrate this caulking pin. In case a caulking pin is crushed by the press section, caulking firm attachment is carried out and the following work piece is again set to the bearing section, it constitutes so that automatic supply of the bundle pin in new may be automatically carried out by the supply arm.

[0004]

[Problem(s) to be Solved by the Invention] However, although the caulking equipment with an automatic feeder style by such supply arm becomes convenient for automatic supply of the caulking pin to be carried out by the supply arm one after another in a predetermined location, if it is the configuration to which horizontal migration of the supply arm is only carried out from the side, it takes the large monopoly tooth space of equipment, and cannot design it small.

[0005] This invention aims at offering the excellent caulking equipment which does not consider as a revolution method but can design the whole airframe in a compact, though a simple supply arm method is adopted while exceeding in simple structure at mass-production nature.

[0006]

[Means for Solving the Problem] The summary of this invention is explained with reference to an accompanying drawing.

[0007] The supply arm B which carries out sequential supply of the caulking pin P at the pin positioning section 2 of the bearing section A which supports the work piece W which has the caulking hole 1, and this bearing section A In the caulking equipment which consists of the press section C which closes the caulking pin P supplied to the pin positioning section 2 Form said bearing section A in the transverse plane of Airframe K, and said press section C is formed above this bearing section A free [ vertical movement ]. While establishing the migration device D which carries out migration control of said supply arm B behind Airframe K, forming the caulking pin feeder style E in the upper part of Airframe K, and preparing free [ order slide migration ] so that the slide protrusion of said supply arm B can be carried out from regions of back to a transverse plane Prepare free [ boom-hoisting migration ] and said migration device D is constituted so that the supply arm B which carried out the back slide can start to regions of back upwards. The maintenance device 3 in which said caulking pin P is held to the point of the supply arm B in which migration control is carried out by this migration device D is established. The caulking equipment characterized by forming the supply controlling mechanism 4 made to hold in said caulking pin feeder style E is started a predetermined number every in the caulking pin which can be supplied one after another at the maintenance device 3 of the supply arm B which carried out slide evacuation to back, and rose upwards to it, and went up to it.

[0008]

[Function] According to an operation of the migration device D, the supply arm B which carried out the back slide starts to regions of back upwards, and the caulking pin P is held from the caulking pin feeder style E by actuation of the supply controlling mechanism 4 at the maintenance device 3 of the predetermined number [ every ] supply arm B.

[0009] The supply arm B which held the caulking pin P according to the maintenance device 3 \*\*\*\* by migration of the migration device D again, a front slide is carried out further, it projects at the front of Airframe K, and the caulking pin P is located in the pin positioning section 2 of the bearing section A.

[0010] The caulking pin P is supplied to the pin positioning section 2 of the bearing section A because the maintenance device 3 carries out discharge actuation, the caulking hole 1 is made to penetrate the caulking pin P, a work piece W is set to the bearing section A, the press section C is dropped, the caulking pin P is crushed and caulking firm attachment is carried out.

[0011]

[Example] This example applies this invention to the peripheral surface of a pan as a work piece W at the caulking equipment which carries out caulking firm attachment of Toride by the caulking pin P.

[0012] This example forms the cylinder-like bearing section A in the transverse plane of Airframe K ahead at a level protrusion condition, as shown in drawing 1, and it constitutes it so that the pan which is a work piece W may be inserted

in and supported in this bearing section A.

[0013] The bearing crevice which can change the positioning maintenance of the caulking pin P into a set-up condition is formed in the top face of the drum peripheral surface of this bearing section A, and it is considering as the pin positioning section 2.

[0014] Along with the airframe K forward surface wall, the press section C is formed in the upper part of this pin positioning section 2 free [ vertical movement ].

[0015] Therefore, the caulking pin P is supplied to the pin positioning section 2 by the supply arm B. Make the caulking hole 1 penetrate the caulking pin P set up in this pin positioning section 2, and insertion bearing of the work piece W is carried out at the bearing section A. After setting so that you may make it go away a firm attachment object (work piece W) and the caulking pin P may also penetrate a hole 1, Toride etc. drops the press section C, crushes the caulking pin P by making the bearing section A into a cradle, and it constitutes so that caulking firm attachment may be carried out.

[0016] The migration device D was formed in the background (regions of back) of the forward surface wall of this airframe K, and the caulking pin feeder style E is formed in that upper part.

[0017] Moreover, the arm passage aperture 5 is formed in the forward surface wall of the airframe K which protruded said bearing section A, this arm passage aperture 5 is passed, and the supply arm B enables it to carry out a slide protrusion from regions of back to a transverse plane. That is, through the arm passage aperture 5, the level guide base 6 was arranged at the cross direction, and the supply arm B is formed free [ an order slide ] on this level guide base 6. The maintenance device 3 which you make it go away at one tip of this supply arm B, and can enable pinching maintenance of the discharge of Pin P prepares, and as shown to drawing 4, when a supply arm B slides the level guide base 6 top to the front by the migration device D, make it a caulking pin P located in the pin positioning section 2 of the bearing section A through an arm passage aperture 5, and it constitutes so that it may supply by carrying out discharge actuation of the maintenance device 3.

[0018] Moreover, it constitutes free [ boom hoisting ] so that it can start perpendicularly upwards, after this supply arm B has carried out the back slide to regions of back, as shown in drawing 3.

[0019] The back end of the supply arm B which specifically formed the maintenance device 3 in the point, and the rotation arm 7 rotated by the driving source are pivoted in a connecting linkage 8. If the rotation arm 7 is further rotated after carrying out longitudinal slide movement of the supply arm B, rotating the supply arm B back and \*\*\*\*(ing) the supply arm B back by carrying out drive rotation of this rotation arm 7, the migration device D is constituted so that the supply arm B may start upwards and may rotate.

[0020] Next, the caulking pin feeder style E is explained.

[0021] As shown in drawing 2, the hopper 13 which throws in the caulking pin P was formed in the upper part of Airframe K, and the receipt drum 10 which kept predetermined spacing and formed in the peripheral surface the positioning receipt slot 9 which contains at a time one caulking pin P thrown in with this hopper 13 is provided in the forward surface wall rear face of Airframe K free [ rotation ].

[0022] The fall guide slot 11 is formed under this receipt drum 10, and if the caulking pin P is contained into every one positioning receipt slot 9 and the fall guide slot 11 is arrived at when the receipt drum 10 rotates, it constitutes so that it may fall from the receipt drum 10 to every one fall guide slot 11.

[0023] He prepares the weir check plate 12 which dams up and carries out the caulking pin P which falls down this fall guide slot 11 free in a two vertical attitude, and is trying to make every one maintenance device 3 at the tip of this supply arm B that carried two sheets, came, was made to carry out antitussive release actuation of the check plate 12 suitably, and was allotted to the set-up condition in the lower limit of this fall guide slot 11 supply the caulking pin P.

[0024] That is, the supply arm B is started according to the migration device D, the maintenance device 3 at the tip of the supply arm B is made into a release condition, and it arranges in the lower limit of the fall guide slot 11.

[0025] On the other hand, the caulking pin P by which column fall receipt is carried out from the condition that the upper weir check plate 12 has dammed up, into the fall guide slot 11 As shown in drawing 5, retreat this weir check plate 12, make one downward weir check plate 12 go away, and Pin P is fallen. As shown in drawing 6, after considering as the condition that the upper weir check plate 12 dammed up again, if the downward weir check plate 12 is retreated, one will be made to go away, Pin P will fall, and the maintenance device 3 of the caulking pin P will be supplied. Pinching actuation of the maintenance device 3 is carried out, the caulking pin P is held according to the maintenance device 3, the supply arm B is \*\*\*\*(ed), slide migration is further carried out to the front, the caulking pin P is moved to the pin positioning section 2 of the bearing section A, the maintenance device 3 is released, and the caulking pin P is supplied on the pin positioning section 2.

[0026] Thus, it constitutes so that it may supply the caulking pin P one [ at a time ] to the pin positioning section 2 automatically.

[0027] In addition, you may constitute so that two or more bodies or the maintenance device 3 may be branched, the supply arm B may be formed at the tip of the supply arm B two or more bodies and automatic supply may be carried out one by one to the plurality [ every ] predetermined pin positioning section 2 at once.

[0028]

[Effect of the Invention] The migration tooth space of a supply arm does not take, and the monopoly tooth space of equipment does not take as a whole, but it becomes with the excellent caulking equipment it can design to the compact equipment of end-fire array, being an automatic supply system by the supply arm, and becoming simple automatic supply structure, since this invention was constituted as mentioned above and it constituted so that boom-hoisting migration might be carried out up and down, after it slid the supply arm to the front from back approximately and the supply arm has moreover slid back.

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## DESCRIPTION OF DRAWINGS

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**[Brief Description of the Drawings]**

**[Drawing 1]** It is the outline block diagram seen from the transverse-plane side of this example.

**[Drawing 2]** It is the outline block diagram seen from the tooth-back side of this example.

**[Drawing 3]** The supply arm of this example is an explanation side elevation in the condition of having started upwards.

**[Drawing 4]** The supply arm of this example is an explanation side elevation in the condition of having carried out the slide protrusion to the transverse plane.

**[Drawing 5]** It is the explanatory view of the supply standby condition of the supply controlling mechanism of this example.

**[Drawing 6]** It is an explanatory view at the time of supply of the supply controlling mechanism of this example.

**[Description of Notations]**

1 Caulking Hole

2 Pin Positioning Section

3 Maintenance Device

4 Supply Controlling Mechanism

A Bearing section

B Supply arm

C Press section

D Migration device

E Caulking pin feeder style

K Airframe

P Caulking pin

W Work piece

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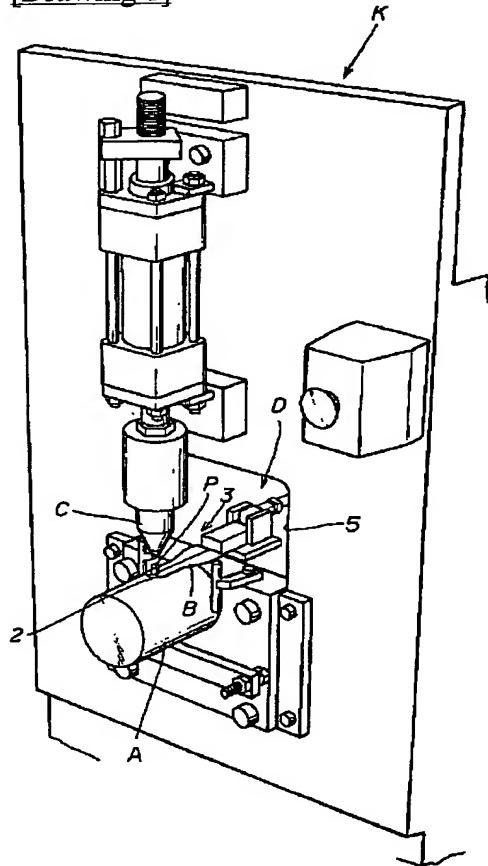
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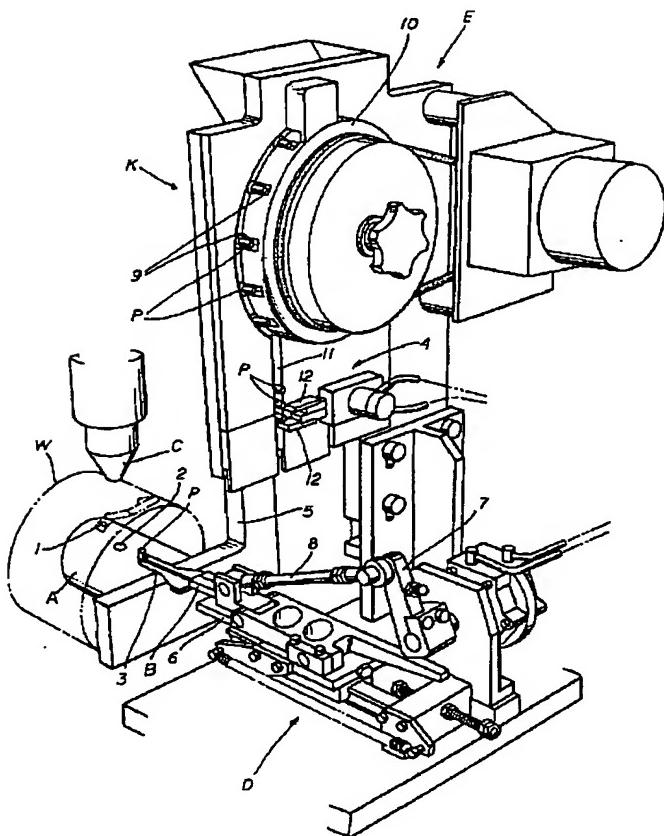
**DRAWINGS**

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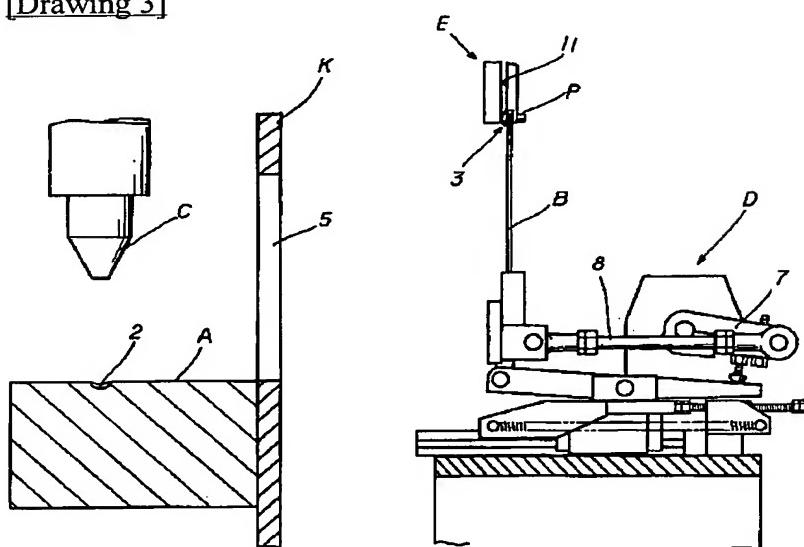
[Drawing 1]



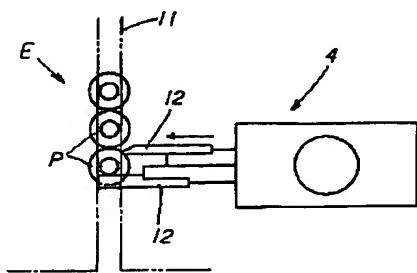
[Drawing 2]



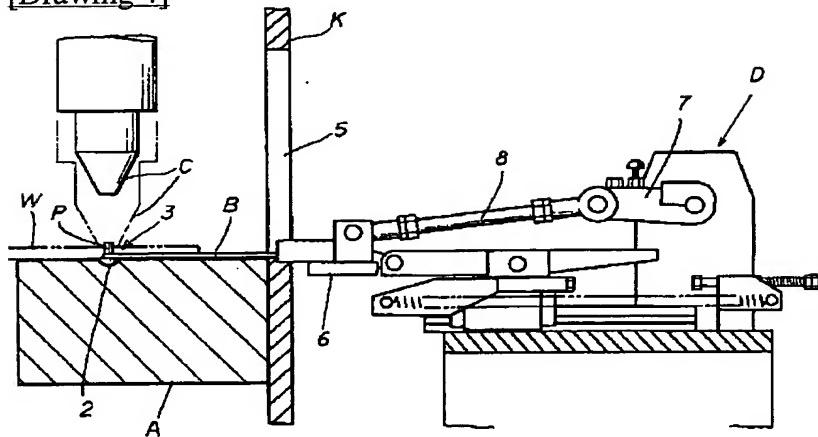
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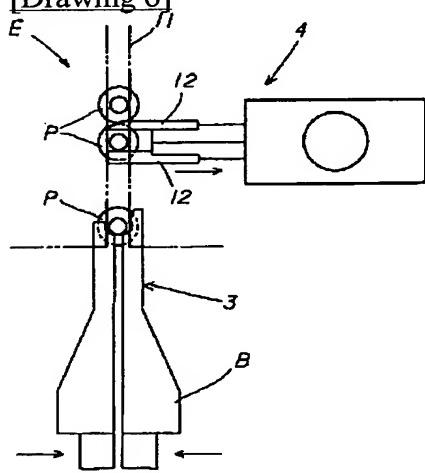
[Drawing 5]



[Drawing 4]



[Drawing 6]



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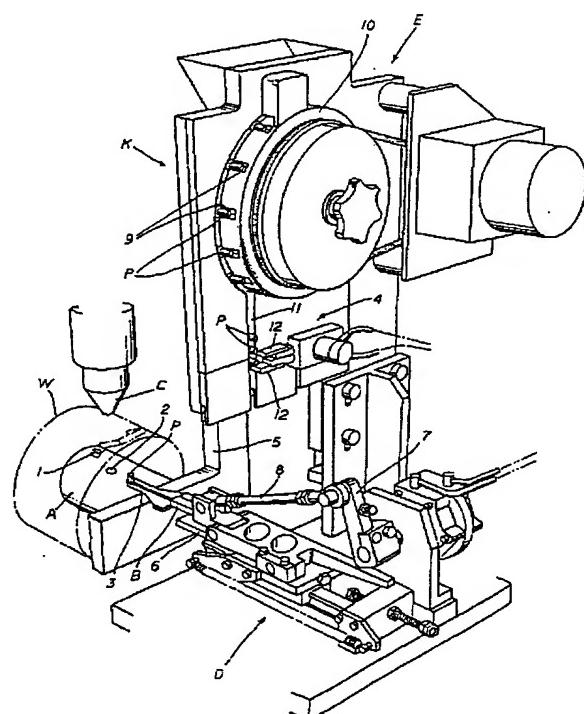
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(54) 【発明の名称】 かしめ装置

(57) 【要約】

**【目的】** 簡易な構造で量産性に秀れると共に、簡易な供給アーム方式を採用しながらも、旋回方式とせず機体全体をコンパクトに設計できる秀れたかしめ装置を提供すること。

【構成】 機体Kの正面に支承部Aを設け、この支承部Aの上方にプレス部Cを上下動自在に設け、機体Kの背部に供給アームBを移動制御する移動機構Dを設け、機体Kの上部にかしめピン供給機構Eを設け、供給アームBを背部より正面へスライド突出し得るように前後スライド移動自在に設けると共に、背部へ後方スライドした供給アームBが上方へ立ち上がり得るように起伏移動自在に設けて移動機構Dを構成し、この移動機構Dにより移動制御される供給アームBの先端部にかしめピンPを保持する保持機構3を設け、後方へスライド退避し且つ上方へ立ち上げ上昇した供給アームBの保持機構3に次々と供給し得るかしめピンを所定数づつ保持せしめる供給制御機構4をかしめピン供給機構Eに設けたかしめ装置。



## 【特許請求の範囲】

【請求項1】 かしめ孔を有するワークを支承する支承部と、この支承部のピン位置決め部にかしめピンを順次供給する供給アームと、ピン位置決め部に供給されたかしめピンをかしめるプレス部から成るかしめ装置において、機体の正面に前記支承部を設け、この支承部の上方に前記プレス部を上下動自在に設け、機体の背部に前記供給アームを移動制御する移動機構を設け、機体の上部にかしめピン供給機構を設け、前記供給アームを背部より正面へスライド突出し得るように前後スライド移動自在に設けると共に、背部へ後方スライドした供給アームが上方へ立ち上がり得るように起伏移動自在に設けて前記移動機構を構成し、この移動機構により移動制御される供給アームの先端部に前記かしめピンを保持する保持機構を設け、後方へスライド退避し且つ上方へ立ち上げ上昇した供給アームの保持機構に次々と供給し得るかしめピンを所定数づつ保持せしめる供給制御機構を前記かしめピン供給機構に設けたことを特徴とするかしめ装置。

## 【発明の詳細な説明】

## 【0001】

【産業上の利用分野】本発明は、自動供給機構付のかしめ装置に関するものである。

## 【0002】

【従来の技術】例えば、鍋の周面に取手を止着するなどに使用するかしめ装置において、かしめピンを順次自動供給する自動供給機構付のかしめ装置が望まれる。

【0003】例えば、かしめピン供給機構から供給アームによりかしめピンを保持し、この供給アームを移動して支承部のピン位置決め部に一つづつかしめピンを供給し、このかしめピンをワークのかしめ孔に貫通させるようにしてワークをこの支承部にセットし、プレス部によりかしめピンを潰してかしめ止着し、再び次のワークを支承部にセットする際に、供給アームにより自動的に新たなかしめピンが自動供給されるように構成する。

## 【0004】

【発明が解決しようとする課題】しかしながら、このような供給アームによる自動供給機構付のかしめ装置は、次々と供給アームによりかしめピンが所定位置に自動供給され便利となるが、単に側方から供給アームを水平移動させる構成とすると、装置の専有スペースを大きくとり、小形に設計できない。

【0005】本発明は、簡易な構造で量産性に秀れると共に、簡易な供給アーム方式を採用しながらも、旋回方式とせず機体全体をコンパクトに設計できる秀れたかしめ装置を提供することを目的としている。

## 【0006】

【課題を解決するための手段】添付図面を参照して本発明の要旨を説明する。

【0007】かしめ孔1を有するワークWを支承する支

承部Aと、この支承部Aのピン位置決め部2にかしめピンPを順次供給する供給アームBと、ピン位置決め部2に供給されたかしめピンPをかしめるプレス部Cから成るかしめ装置において、機体Kの正面に前記支承部Aを設け、この支承部Aの上方に前記プレス部Cを上下動自在に設け、機体Kの背部に前記供給アームBを移動制御する移動機構Dを設け、機体Kの上部にかしめピン供給機構Eを設け、前記供給アームBを背部より正面へスライド突出し得るように前後スライド移動自在に設けると共に、背部へ後方スライドした供給アームBが上方へ立ち上がり得るように起伏移動自在に設けて前記移動機構Dを構成し、この移動機構Dにより移動制御される供給アームBの先端部に前記かしめピンPを保持する保持機構3を設け、後方へスライド退避し且つ上方へ立ち上げ上昇した供給アームBの保持機構3に次々と供給し得るかしめピンを所定数づつ保持せしめる供給制御機構4を前記かしめピン供給機構Eに設けたことを特徴とするかしめ装置に係るものである。

## 【0008】

【作用】移動機構Dの作用により、背部へ後方スライドした供給アームBが上方へ立ち上がり、供給制御機構4の作動によりかしめピン供給機構EからかしめピンPが所定数づつ供給アームBの保持機構3に保持される。

【0009】かしめピンPを保持機構3により保持した供給アームBが再び移動機構Dの移動により伏動し、更に前方スライドして機体Kの正面に突出して支承部Aのピン位置決め部2にかしめピンPが位置する。

【0010】保持機構3が解除作動することでかしめピンPを支承部Aのピン位置決め部2に供給し、かしめ孔1にかしめピンPを貫通させて支承部AにワークWをセットし、プレス部Cを下降させてかしめピンPを潰してかしめ止着する。

## 【0011】

【実施例】本実施例は、ワークWとして鍋の周面に取手をかしめピンPによりかしめ止着するかしめ装置に本発明を適用したものである。

【0012】本実施例は、図1に示すように機体Kの正面に円筒状の支承部Aを前方に水平突出状態に設け、この支承部AにワークWである鍋を被嵌して支承するよう構成している。

【0013】この支承部Aのドラム周面の上面にかしめピンPを立設状態に位置決め保持し得る支承凹部を形成してピン位置決め部2としている。

【0014】このピン位置決め部2の上部に機体K正面壁に沿ってプレス部Cを上下動自在に設けている。

【0015】従って、供給アームBによりピン位置決め部2にかしめピンPが供給され、このピン位置決め部2に立設したかしめピンPをかしめ孔1に貫通させてワークWを支承部Aに被嵌支承し、取手などの止着物(ワークW)のかしめ孔1もかしめピンPが貫通するようにセ

ットした後、プレス部Cを下降させて支承部Aを受台としてかしめピンPを潰し、かしめ止着されるように構成している。

【0016】この機体Kの正面壁の裏側（背部）に移動機構Dを設け、その上部にかしめピン供給機構Eを設けている。

【0017】また、前記支承部Aを突設した機体Kの正面壁にアーム通過窓5を形成し、このアーム通過窓5を通過して供給アームBが背部より正面へスライド突出し得るようにしている。即ち、アーム通過窓5を介して前後方向に水平ガイド台6を配設し、この水平ガイド台6上に供給アームBを前後スライド自在に設けている。この供給アームBの先端には一つのかしめピンPを解除自在に挿持保持し得る保持機構3を設け、図4に示すように水平ガイド台6上を移動機構Dにより供給アームBが前方へスライドした際、アーム通過窓5を介して支承部Aのピン位置決め部2にかしめピンPを位置せしめ、保持機構3を解除作動させることで供給するように構成している。

【0018】また、図3に示すようにこの供給アームBが背部へ後方スライドした状態で上方へ垂直に立ち上がり得るように起伏自在に構成している。

【0019】具体的には先端部に保持機構3を設けた供給アームBの後端と駆動源により回動する回動腕7とを連結リンク8で枢着し、この回動腕7を駆動回動することにより供給アームBを前後動させ、供給アームBを後方へ回動して供給アームBを後方へ引動した上で更に回動腕7を回動させると、供給アームBが上方へ立ち上がり回動するように移動機構Dを構成している。

【0020】次にかしめピン供給機構Eについて説明する。

【0021】図2に示すように、機体Kの上部にかしめピンPを投入するホッパー13を設け、このホッパー13により投入されたかしめピンPを一本づつ収納する位置決め収納溝9を所定間隔を置いて周面に形成した収納ドラム10を機体Kの正面壁裏面に回転自在に設けている。

【0022】この収納ドラム10の下方に落下ガイド溝11を設け、収納ドラム10が回動することにより位置決め収納溝9に一つづつかしめピンPを収納し、落下ガイド溝11に達すると収納ドラム10から落下ガイド溝11へ一つづつ落下するように構成している。

【0023】この落下ガイド溝11の下方に落下するかしめピンPをせき止めするせき止め板12を上下二体進退自在に設け、この二枚のせき止め板12を適宜せき止め解放作動させてこの落下ガイド溝11の下端に立設状態に配した供給アームBの先端の保持機構3に一つづつかしめピンPを供給するようにしている。

【0024】即ち、供給アームBを移動機構Dにより立ち起こして供給アームBの先端の保持機構3を解放状態とし、落下ガイド溝11の下端に配設する。

【0025】一方、落下ガイド溝11に縦列落下収納されているかしめピンPを上方のせき止め板12でせき止めている状態から、図5に示すようにこのせき止め板12を後退させて下方のせき止め板12に一つのかしめピンPを落下し、図6に示すように再び上方のせき止め板12でせき止められた状態としてから、下方のせき止め板12を後退させると一つのかしめピンPが落下してかしめピンPの保持機構3へ供給される。

10 保持機構3を挿持作動させて保持機構3によりかしめピンPを保持して供給アームBを伏動し、更に前方へスライド移動して支承部Aのピン位置決め部2へかしめピンPを移動し、保持機構3を解放してピン位置決め部2上にかしめピンPを供給する。

【0026】このようにして一つづつ自動的にかしめピンPをピン位置決め部2へ供給するように構成している。

【0027】尚、供給アームBを複数体或いは保持機構3を分岐させて供給アームBの先端に複数体設けて一度に複数個づつ所定のピン位置決め部2へ順次自動供給するように構成しても良い。

#### 【0028】

【発明の効果】本発明は上述のように構成したから、供給アームは後方から前方へ前後スライドし、しかも供給アームが後方へスライドした状態で上下に起伏移動し得るように構成したため、供給アームによる自動供給方式であり簡易な自動供給構造となりながら、供給アームの移動スペースを取らず、全体として装置の専有スペースを取らず、縦形のコンパクトな装置に設計できる秀れたかしめ装置となる。

#### 【図面の簡単な説明】

【図1】本実施例の正面側から見た概略構成図である。

【図2】本実施例の背面側から見た概略構成図である。

【図3】本実施例の供給アームが上方へ立ち上がった状態の説明側面図である。

【図4】本実施例の供給アームが正面へスライド突出した状態の説明側面図である。

【図5】本実施例の供給制御機構の供給待機状態の説明図である。

【図6】本実施例の供給制御機構の供給時の説明図である。

#### 【符号の説明】

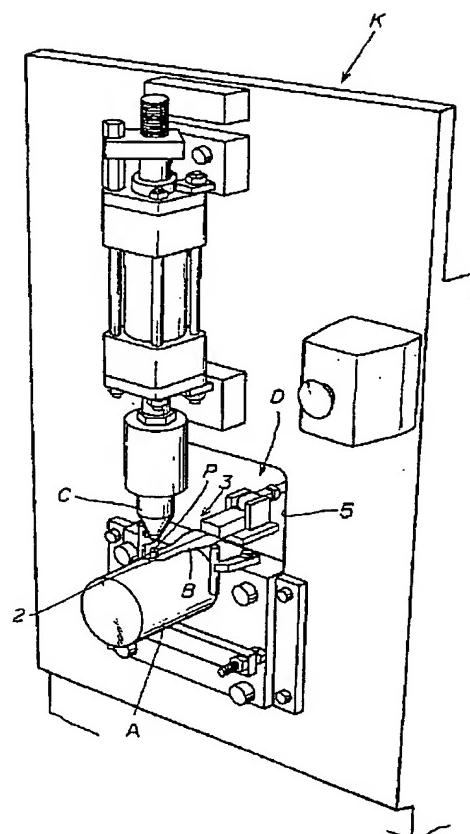
- 1 かしめ孔
- 2 ピン位置決め部
- 3 保持機構
- 4 供給制御機構
- A 支承部
- B 供給アーム
- C プレス部
- D 移動機構
- E かしめピン供給機構

K 機体

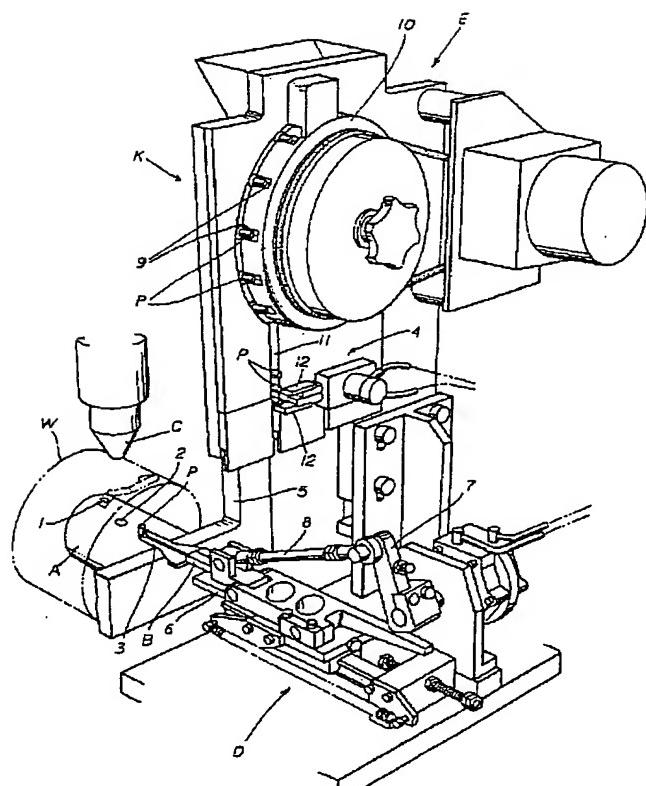
P かしめピン

W ワーク

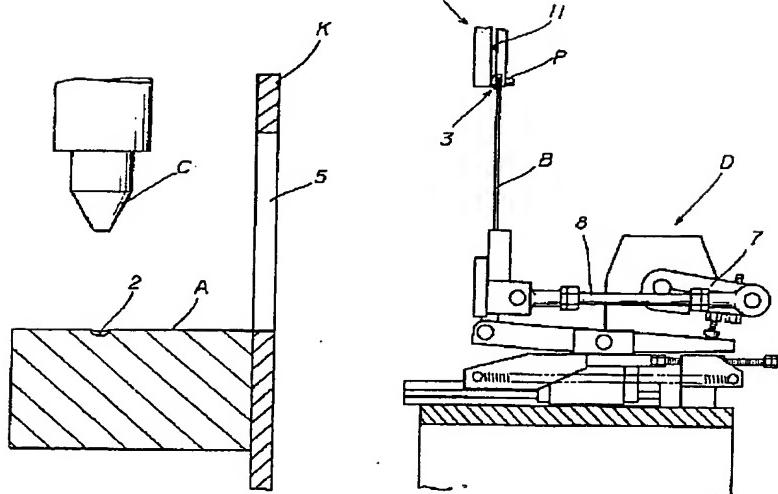
【図1】



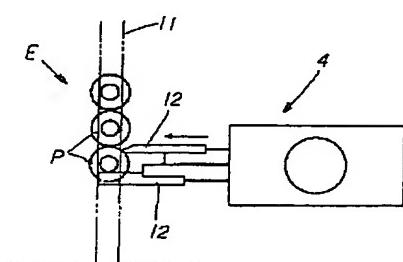
【図2】



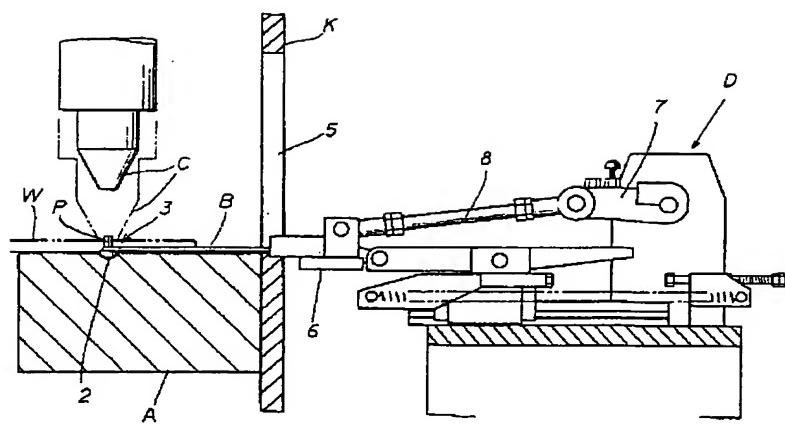
【図3】



【図5】



【図4】



【図6】

